AS1MET SERVICES
4516 McCALL CREEK RD BLANCO, TX 78606

Independent Third Party Audit of the Air Quality Analysis for ASARCO Incorporated El Paso Smelter Plant Renewal of TCEQ Permit 20345

Prepared for:

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Prepared by:

Arnold R. Srackangast

AS1MET Services
Blanco, Texas

April 23, 2007

EXECUTIVE SUMMARY

This report presents findings from an independent audit of the November 22, 2006 air quality analysis submitted by ASARCO LLC (ASARCO, the applicant) to the Texas Commission on Environmental Quality (TCEQ) to support Renewal of Permit 20345 for the El Paso Smelter Plant. Both the air quality analysis and independent review were stipulated by the Executive Director in a letter to ASARCO dated May 5, 2006. The scope of this audit was to review the analysis against the Air Quality Analysis Protocol, provided to ASARCO as an attachment to the same May 5, 2006 letter. This audit was conducted independently of TCEQ or ASARCO. Conclusions presented are based on the professional judgment of the reviewer and offered for the consideration of TCEQ. Where presented, recommendations and conclusions are non-binding.

Results from the review indicate the applicant conducted the air quality analysis in accordance with the May 5, 2006 TCEQ modeling protocol (Protocol). As such, the modeling results and conclusions presented in the analysis satisfy TCEQ requirements. Modeled results show compliance for all constituents evaluated. However, comments are offered on portions of the analysis that may warrant further consideration by TCEQ. These issues include: 1) the potential for terrain-induced downwash from the Acid Plant Stack (Emission Point Number: AP/S); and, 2) the representativeness of the meteorological data used in the analysis, and/or data for future analyses. Further analysis may be necessary, at TCEQ's discretion, either by TCEQ or the applicant, in order to determine the significance of these issues. Variances from available guidance are noted where they occur, specifically the determination of background concentrations via use of the 95th percentile of the monitored values.

1.0 Project Identification Information

Applicant:	ASARCO LLC, El Paso Plant
Permit Number:	23045
Regulated Entity Number:	RN100219021
Customer Reference Number:	CN
Nearest City and County	City of El Paso; El Paso County
Applicant's Modeler	David Cabe, Zephyr Environmental Corp.
Submittal Date	November 22, 2006

2.0 Report Summary

Based on the review of the air quality analysis and professional judgment, the audit finds that the applicant conducted the air quality analysis in accordance with the May 5, 2006 TCEQ modeling protocol (Protocol). As such, the conclusions presented in the analysis are deemed acceptable and satisfy TCEQ requirements. A total of 32 compounds were addressed in the air quality analysis, which encompassed a domain of 50 kilometers, including all monitors and schools within this region. Tables 2-1 and 2-2 were extracted from the Analysis and presented for convenience.

All criteria pollutant modeling results of Plant emissions showed compliance. For the State property-line analysis (TCEQ Chapter 116), the highest SO_2 1-hour predicted concentration was 923 $\mu g/m^3$, or 90% of the 1021 $\mu g/m^3$ (0.4 ppm) standard. (Note: the applicant misrepresented the SO_2 1-hour standard as 0.5 ppm instead of 0.4 ppm). The primary contributor to this high concentration was found to be the Acid Plant Stack (EPN: AP/S). Based on the calculation of Good Engineering Practice (GEP) Stack Height using nearby terrain, this source should be reviewed for terrain-induced downwash. In addition, the maximum impact was located at a 500-meter receptor in complex terrain. Nearby receptors were dramatically less than the maximum value.

$PM_{2.5}$ and PM_{10} 24-hour and annual model-predicted concentrations were high due to the addition of a conservative background concentrations. For the $PM_{2.5}$ short-term NAAQS, the highest 7^{th}-high concentration was reported, which is appropriate since the standard is based on the 98^{th} percentile. The highest second-high 24-hour concentrations was presented for PM10, which is appropriate.

Maximum modeled impacts for five compounds exceeded the TCEQ Effects Screening Level (ESL) guideline concentrations (arsenic, copper dust, copper fume, manganense oxide, and silver). The magnitude of the ESL exceedances were shown to be no higher than 1, with a frequency of occurrence totaling less than 24-hours. These concentrations are within acceptable levels established by TCEQ (TCEQ, 2001).

Table 2-1. Criteria Pollutant Modeling Results Summary

Results for NAAQS and Property Line Standard Air Contaminants (concentrations in micrograms per cubic meter except as noted)						
Air Contaminant	Averaging Period	Standard	Background Level[a]	Modeled Concentration Due to Plant[b]		
				Maximum Anywhere	Maximum at Any School	Maximum at Any Monitor
Sulfur Dioxide	1-hour	0.5 ppmv	NA	0.4 ppmv	<0.1 ppmv	< 0.1 ppmv
	3-hour	1,300	664	249	131.5	133
	24-hour	365	185	73.4	34.0	62.0
	Annual	80	27	9.1	4.3	8.4
Nitrogen Dioxide	Annual	100	38	8.5	0.7	0.1
PM_{10}	24-hour	150	93	26.3	9.8	1.4
	Annual	50	41	4.6	0.6	0.2
$PM_{2.5}$	24-hour	35	21	8.9	2.5	1.4
	Annual	15	8.5	2.4	0.4	0.2
Carbon Monoxide	1-hour	40,000	NA[e]	53.6	20.0	7.0
	8-hour	10,000	NA[e]	22.6	5.2	1.4
Lead[c]	3-month	1.5	0.07	0.2	0.04	0.004
Sulfuric Acid	1-hour	50	NA	6.7	1.0	NA[d]
	24-hour	15	NA	0.4	0.1	NA[d]

a. Monitored concentrations representative of highest existing levels in areas of maximum impacts modeled for Plant

b. Highest 2nd high modeled concentrations reported for short-term averaging periods, except for property-line standard evaluations, where highest 1st high concentration reported (sulfuric acid and 1-hour sulfur dioxide)

c. Maximum modeled lead concentrations are monthly averages, providing for conservative comparisons to the quarterly standard

d. No sulfuric acid ambient air quality monitoring data are known to have been collected in the El Paso/Juarez areas

e. Not presented since maximum modeled impacts for Plant are less than EPA and TCEQ significant impact levels

---

[1] The NAAQS were established by EPA to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly and to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

[2] The net ground-level concentration standards were established by the TCEQ to limit the net off-property concentration resulting from emissions from a single property on contiguous properties. In this Analysis, the "property" is the ASARCO El Paso Plant site.

Table 2-2. ESL Modeling Results Summary – Page 1

Air Contaminant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$)	ESL ($\mu g/m^3$)	No. of Exceedances of ESL
Alumina	1-hr	1.8	50	0
	Annual	0.04	5	0
Antimony	1-hr	0.2	5	0
	Annual	0.004	0.5	0
Arsenic	1-hr	0.17	0.1	7
	Annual	0.003	0.01	0
Barium	1-hr	0.05	5	0
	Annual	0.001	0.5	0

Air Contaminant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$)	ESL ($\mu g/m^3$)	No. of Exceedances of ESL
Silver	1-hr	0.13	0.1	3
	Annual	0.002	0.01	0
Tellurium	1-hr	0.09	1	0
	Annual	0.001	0.1	0
Thallium	1-hr	0.008	1	0
	Annual	0.0002	0.1	0
Zinc Oxide	1-hr	2.0	50	0
	Annual	0.02	5	0

Table 2-2. ESL Modeling Results Summary – Page 2

Air Contaminant	Averaging Time	Maximum Modeled Concentration (µg/m³)	ESL (µg/m³)	No. of Exceedances of ESL
Bismuth	1-hr	0.17	50	0
	Annual	0.003	5	0
Cadmium	1-hr	0.04	0.1	0
	Annual	0.001	0.01	0
Calcium Oxide	1-hr	5.3	20	0
	Annual	0.08	2	0
Chromium	1-hr	0.02	1	0
	Annual	0.0003	0.1	0
Cobalt	1-hr	0.04	0.2	0
	Annual	0.001	0.02	0
Copper Dust	1-hr	21.9	10	13
	Annual	0.15	1	0
Copper Fume	1-hr	1.0	1	1
	Annual	0.01	0.1	0
Gypsum	1-hr	1.7	50	0
	Annual	0.03	5	0
Iron Dust	1-hour	34.5	50[11]	0
	Annual	0.59	5	0
Iron Oxide Fume	1-hr	9.2	50	0
	Annual	0.1	5	0
Limestone Dust	1-hr	5.3	50	0
	Annual	0.08	5	0
Manganese Oxide	1-hr	3.3	2	6
	Annual	0.02	0.2	0
Mercury	1-hr	0.0002	0.25	0
	Annual	0.00001	0.025	0
Nickel	1-hr	0.06	0.15	0
	Annual	0.001	0.015	0
Selenium	1-hr	0.04	2	0
	Annual	0.0008	0.2	0
Amorphous Silica (Respirable)	1-hr	1.1	10	0
	Annual	0.02	1	0
Crystalline Silica (Respirable)	1-hr	4.1	10	0
	Annual	0.1	1	0

[11] The ESLs for iron oxide were used for comparison with the modeled concentrations for iron dust since iron is not received at the Plant as a salt or a pentacarbonyl, the only other iron compounds for which ESLs for iron exist.

[13] Although the TCEQ only required that public schools be evaluated, several private schools were also included in the Analysis

3.0 Plot Plan

> **Plot Plan**
> ASARCO should provide a plot plan that shows a representation of locations of emission sources and buildings. It is preferred that ASARCO submit the plot plan electronically in either "dwg" or "dxf" formats.

The plot plan, presented in Section 4.0 of the analysis, and submitted electronically, satisfies the requirements of the Protocol. For audit purposes, modeled emission source locations and buildings were overlaid on 1-meter resolution El Paso County digital aerial photography obtained from the Texas Natural Resource Information Service (TNRIS: www.tnris.state.tx.us). The facility layout matched the aerial photography.

4.0 Area Map

> **Area Map**
> ASARCO should provide an area map that shows a representation of the current property line, topography, and location of practicably known schools and ambient air monitors located within 50 kilometers. School is defined in the Texas Health and Safety Code § 382.052 as an elementary, junior high, or senior high school.

The area maps, presented in Section 3.0 of the Analysis, as well as Figures 3 and 4 of the Executive Summary, satisfy the requirements of the Protocol. Appendix F of the Analysis identified the location of all schools (El Paso, US Schools (non-El Paso), and Mexico). Though not requested, the applicant also located and included model-predicted results at private schools.

5.0 Air Monitoring Data

Air Monitoring Data
ASARCO should obtain available ambient air monitoring data from Texas, New Mexico and Mexico within 50 kilometers of the site. These data will be used as representative background concentrations of air quality. For short-term (averaging periods of 24-hours or less) standards and ESLs, provide the highest monitored concentrations from data within the most recent three years. For quarterly and annual standards and ESLs, provide the highest monitored concentrations from complete quarters or years within the most recent three years.

If monitoring data within the past three years are not available for a contaminant that ASARCO would be authorized to emit, older monitoring data from a period when ASARCO facilities were shut down could be used.

The summary of air quality monitoring data, presented in Section 6.0 of the analysis, satisfies the requirements of the Protocol. Monitored concentrations for 26 monitors within 50km of ASARCO are summarized for the three-year period 2003-2005, along with available data for 2006. For all averaging periods, the highest concentration is presented, accompanied by the highest 2nd-high concentration for short-term standards (24-hours or less).

For the State NAAQS analysis for SO_2, NO_2, Lead, PM_{10}, and $PM_{2.5}$, a background concentration must be added to modeled impacts. Table 5-1 summarizes the background concentrations provided by the applicant. The highest monitored concentration was used to represent short-term background concentrations for all compounds, except $PM_{2.5}$ and PM_{10}. Use of the highest monitored concentration for background is conservative. For $PM_{2.5}$ and PM_{10}, a refined background concentration was determined based upon the 95th percentile of yearly measured values. TCEQ guidance for determining background concentrations was reviewed to determine the appropriateness of these values (TCEQ, 1998). By itself, the 95th percentile approach is questionable since it is not presented as one of the steps for determining refined background concentrations. However, the applicant also presents a summary of monitored concentrations for days with similar meteorology to the highest modeled PM_{10} impacts. This particular approach is identified under Step 4 of the TCEQ background guidance document:

- Identify the location of the receptors with significant concentrations from the project. Determine the meteorological conditions associated with these concentrations. Obtain hourly or daily concentrations and corresponding meteorological data from the Data Management and Analysis Section, Monitoring Operations Division. Find meteorological conditions that are similar to those that caused the modeled concentrations and identify applicable monitoring data with the same meteorological conditions. Use this concentration as the background concentration.

Given the acceptability of the Step 4 approach, and that these results are less than the 95th percentile results, the 95th percentile background concentrations are acceptable.

Table 5-1. Background Concentrations for SO_2, NO_2, PM_{10}, $PM_{2.5}$, and Pb

Pollutant/ Averaging Period	Background Concentration	Basis/ Monitor ID
SO_2		
3-hr	0.246 ppm (644 µg/m³)	H1H (Rio)
24-hr	0.071 ppm (185 µg/m³)	H1H (Rio)
Annual	0.010 ppm (27 µg/m³)	Annual Avg (Rio)
NO_2		
Annual	0.02 ppm (38 µg/m)	Annual Avg (C41)
PM_{10}		
24-hr	93 µg/m3	95th percentile (C12)
Annual	41 µg/m3	Annual avg (C12)
$PM_{2.5}$		
24-hr	21 µg/m3	95th percentile (C12)
Annual	8.5 µg/m3	Annual avg (C12)
Pb		
Quarter	0.07 µg/m3	H1H (C413)

H1H = highest monitored concentration for the averaging period of interest

6.0 Modeling Emissions Inventory

Modeling Emissions Inventory
For this air quality analysis, all primary and secondary sources of air contaminants emitted from the site must be included in the site-wide analysis whether authorized by permit-by-rule (standard exemption), standard permit or other new source review permit or authorization. Contaminants include: all pollutants with National Ambient Air Quality Standards (NAAQS) except ozone - e.g. PM_{10}, $PM_{2.5}$, SO_2, Pb, NO_2, and CO; state regulated pollutants listed in Chapters 111 and 112 of 30 Texas Administrative Code; and pollutants with an Effects Screening Level (ESL).

If ambient air monitoring data for criteria pollutants is not available in Texas within 50 kilometers of the site, ASARCO should develop an emissions inventory for those contaminants and include those emissions in the modeling analysis.

ASARCO should provide a table listing the correlation between source identifications (IDs) used in the analysis and the emission point numbers (EPNs) listed on the permit application Table 1(a).

ASARCO should provide a description of source characterizations used in the analysis and an explanation why those characterizations are appropriate. For example, if an area source representation is chosen, the source should physically be emitting pollutants nearly homogeneously throughout a horizontal plane.

ASARCO should provide justification for any claimed adjustments to predicted concentrations due to certain source characterizations. For example, the modeling adjustment factor for fugitive emissions may be used with the Industrial Source Complex Short-Term (ISCST3) model (third revision) but not with the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). According to AERMOD technical references, AERMOD should be more representative in accounting for turbulence effects related to low wind speeds and stable atmospheric conditions than ISCST3. The TCEQ has not determined if adjustment factors should be developed for AERMOD at this time.

Section 8.1 of the analysis states that the modeled emission inventory was comprised of all primary and secondary emissions authorized at the site, including Permit 20345, Permit 4151, and Permit-by-Rule (PBRs). Regulatory tables, such as the Table 1a or Maximum Allowable Emission Rate Table (MAERT), were not included with the analysis; thus, this statement could not be independently verified. The approved emission rates were provided in a Microsoft Excel® spreadsheet (filename: ASARCO Model Input Excel Files.xls) and formed the basis of the emissions audit. The report states several emission rate revisions were applied to the Renewal based on improved methodologies and/or emission factors. Corresponding documentation for these calculations were summarized in Appendices C and H. The applicant should provide an updated Table 1a and/or MAERT for the Renewal that incorporates the modeled emission rates.

Model input parameters were consistent with the modeling report and are appropriate. All but one source was modeled as a point source; the exception being the slag skimming activity (Emission Point Number [EPN]: F-RSS) which was modeled as a volume source using effective stack parameters. Emissions from matte pouring (EPN: F/MATTE/P) and slag pouring (EPN: F/SLAG/P) occur outdoors and were modeled as point sources with buoyant plume rise.

A merged plume was modeled for the Main Copper Stack (EPN: CU/STK/AN). This stack contains a center stack surrounded by an annulus. Equivalent stack parameters were determined based on merging the flows from the two portions of the stack. Under 40 CFR §51.100 (hh)(2)(ii)(A), this dispersion technique is acceptable since the stack, built in 1967, was originally constructed with these merged gas streams.

Short-term emission rates were used for all compounds having a short-term standard. Annual rates were used for annual modeling. Some discrepancies between the PM_{10} annual emission rates presented in the master emission rate spreadsheet and Appendix C were noticed; however, since the modeled emission rate was higher than the rate presented in the master emission spreadsheet, any effect on annual modeled results would be less than presented in the report.

Emission factor scalars were included for sources not operating 24-hours a day (i.e., daytime hours only). An hour-of-day scalar value of 1 was used for hours 7:00 am through 7:00pm, with remaining hours of the day set to 0.

Figure 1 of the Executive Summary shows dark areas at the northern end of the main property that appear to be storage piles. No emissions sources in this region were included in the modeling. To the extent that it has not done so, the applicant may need to explain, to TCEQ's satisfaction, the nature of these emission sources and why they should not have been included in the modeling.

Off-site sources were not included in the NAAQS analysis. Rather, the NAAQS demonstration was performed by adding modeled impacts from ASARCO emissions to ambient monitored concentrations. This option was provided for, and follows, the Protocol.

7.0 Model Used and Modeling Techniques

Models Proposed and Modeling Techniques
ASARCO may select ISCST3 version 02035 or AERMOD version 04300. If ISCST3 is selected and predicts the occurrence of a re-circulation cavity on the leeward side of a structure that extends off-property, then ISC-PRIME (Plume Rise Model Enhancement) (version 04269) should be used to predict concentrations for the receptors within the cavity.

The Protocol gave the applicant the option to choose either ISCST3 version 02035 or AERMOD 04300 to perform the analysis. As presented in Section 9.2, ASARCO selected AERMOD version 04300 to perform the analysis; thus, satisfying this requirement of the Protocol. As of December 9, 2006, AERMOD has replaced ISCST3 as the EPA-preferred modeling for regulatory modeling applications and is appropriate given the complex terrain in the region.

8.0 Selection of Dispersion Coefficients

Selection of Dispersion Coefficients
ASARCO should provide documentation on how dispersion coefficients for use with ISCST3 were chosen. For AERMOD, ASARCO should provide documentation for the choice of albedo, Bowen Ratio, and roughness length.

On-site meteorological data set was processed and used in the modeling. The applicant's selections for albedo, Bowen Ratio, and roughness length for input to the AERMET meteorological preprocessor were sufficiently documented in Section 9.3 of the analysis, and are deemed appropriate. A 3-km region surrounding the plant was divided in to 12 30-degree sectors. Sector-averaged values for albedo, Bowen Ratio, and roughness length were determined within this domain.

9.0 Building Wake Effects (Downwash)

Building Wake Effects
For ASARCO sources only, provide a table listing all downwash structures used in the modeling demonstration and the associated building/tier heights.

The applicant selected AERMOD 04300 which incorporates the PRIME downwash algorithm. Appendix E of the Analysis provided a listing of all downwash structures included in the Building Parameter Input Program (BPIP–PRIME) Version 04274. The base elevation for all buildings and sources was set to the Plant base elevation of 1155.19 meters. Modeled emission source locations and buildings were overlaid on 1-meter resolution El Paso County digital aerial photography obtained from the Texas Natural Resource Information Service (TNRIS: www.tnris.state.tx.us). The facility layout showed agreement with aerial photography.

See Section 10.0 for the discussion regarding Good Engineering Practice (GEP) Stack Height determinations and potential terrain-induced downwash.

10.0 Terrain

Terrain

If ASARCO chooses to use ISCST3, then the flat terrain option should be used when modeling fugitive emissions and the complex terrain option should be used when modeling stacks. Predicted concentrations resulting from fugitive sources should be added to the predicted concentrations resulting from stacks.

If ASARCO chooses to use AERMOD, then terrain should be included for all sources, buildings, and receptors.

Terrain elevations and hill heights were derived from 30-meter resolution Digital Elevation Model (DEM) data. The AERMAP preprocessor was used to derive terrain maxima (i.e., hill heights). According to the report, the base elevation for all buildings and sources was set to 1155.19 meters. However, in the course of the review, some modeling runs for schools and monitors were discovered to have been modeled using localized base elevations. Given the distance to the monitors and schools, the implication of this discrepancy on the presented results is believed to be minor.

The applicant presented Good Engineering Practice (GEP) Stack Height calculations for the Main Copper Stack (EPN: CU/STK/AN) and Acid Plant Stack (EPN AP/S) based on nearby terrain. The applicant determined nearby terrain in accordance with GEP Stack Height definitions 40CFR §51.100(ii). The applicant modeled the Main Copper Stack with a terrain-based GEP stack height of 550 ft. The physical stack height for the Main Copper Stack is 828 ft. However, the Main Copper Stack was constructed in 1967; thus, it was in existence on December 31, 1970, and is grandfathered from GEP requirements under 40CFR § 51.118(b). Therefore, the physical stack height is the GEP height and should have been modeled (EPA, 1985). Since the physical stack height is above the nearby terrain, terrain-induced downwash is unlikely for this stack. Moreover, lower modeled concentrations would be expected from the 828-ft stack, as compared to the 550-ft stack. The stack height used in the modeling analysis is deemed conservative.

For the Acid Plant stack, the physical stack is 300 ft; whereas, the GEP stack height, calculated from nearby terrain, is 375 feet. Since the physical stack height is less than GEP, the physical stack height was appropriately used in the modeling analysis. Given that the physical stack height of the Acid Gas Stack (300 ft) is less than the GEP stack height (375 ft), it is possible nearby terrain may be inducing downwash on this stack (i.e, terrain-induced downwash). It is recommended that this potential issue be investigated further. If terrain is not influencing the stack, the creditable GEP Stack Height would only be 65 meters (213 ft).

11.0 Receptor Grid

Receptor Grid

ASARCO should develop a receptor grid that extends 50 kilometers from the ASARCO site for all modeling runs. Receptors should be placed in Texas, Mexico, and New Mexico. All identified schools and ambient air monitors within 50 kilometers in Texas, Mexico, and New Mexico should be modeled as discrete receptors. ASARCO should place additional discrete receptors around the school and monitor receptors per standard modeling guidance.

The modeled receptor grid satisfies the Protocol. A "full receptor grid" extending to 50-km grid was modeled, accompanied by receptors specifically placed at ambient monitors and schools. For the most part, the receptor grid was extensive and dense enough in spatial coverage to properly capture the maximum impact. However, the maximum-modeled SO_2 1-hour result exceeded 75 percent of the TCEQ Regulation II standard, and was located at a course receptor (500-meter) in complex terrain. TCEQ guidance suggests additional modeling should have been conducted using a refined set of "tight" receptors around this course receptor to ensure the maximum concentration is fully captured (TCEQ, 1998).

12.0 Meteorological Data

Meteorological Data
ASARCO should use all available on-site meteorological data for criteria pollutant (NAAQS) modeling. For all other modeling, ASARCO should use the on-site meteorological data from 1976. If AERMOD is used, ASARCO should provide documentation on how these data were formatted for use in AERMOD and what adjustments, if any, were made.

The on-site meteorological data collected in 1976 was used as surface data input to AERMOD. These data were comprised of wind speed, wind direction and temperature measurements collected with a 75-ft meteorological tower. Per prior guidance from EPA and TCEQ, the 75-ft measurements were adjusted down to 10-meters, for State Implementation Plan (SIP) modeling purposes using ISCST. These same data were also used in the 1992 permit application modeling. The 10-meter adjusted wind data were extracted from the 1976 ISCST meteorological data set, and coupled with El Paso cloud cover data and upper air data, along with the site-specific values for albedo, surface roughness, and Bowen ratio, to create the AERMOD-compatible meteorological data set.

The Protocol gave the applicant the option of using either ISCST or AERMOD. While use of the 1976 data follows guidance, the representativeness may be questionable, given the adjustment of these data to 10-meters. Vertical profiles of wind, turbulence, and temperature are fundamentally different between AERMET/AERMOD and ISCST. Preferably, the original 75-ft observations should have been used in the processing. Apparently, these observations can no longer be located.

In addition, several monitors now operate in the region: most notably TCEQ CAMS 12 (EPA ID #481401137; State ID C12), located at the University of Texas at El Paso (UTEP), just 2.7 km away from the main copper stack. This station consists of a 10-meter tower that continuously collects wind speed, wind direction, horizontal wind direction standard deviation, and ambient temperature. These data would appear to be representative of ASARCO. If so, these data should have been considered for inclusion in the analysis, given the recent period of record (1998 to present), absence of adjustments, and availability of turbulence parameters sought in AERMET/AERMOD.

If the nearby TCEQ monitoring data are not deemed representative, the collection of at least 1-year on-site meteorological data from a multi-level tower is recommended.

13.0 Modeling Results

Modeling Results

ASARCO should provide results in maps and tables for each modeled contaminant and for each applicable short-term and long-term averaging period. The maps and tables should include the applicable standard or ESL, overall maximum predicted concentrations anywhere off-property, predicted maximum concentrations at the location of each identified school and ambient air monitor located within 50 kilometers, and representative observed concentrations at the monitor locations. For short-term ESLs, the maps and tables should include both magnitude and frequency of exceedance information.

If the results of the analysis show that a standard or ESL could be exceeded when the ASARCO maximum predicted concentration is added to a monitored background concentration, ASARCO should discuss whether the prediction is not representative due to meteorological factors and should be excluded. ASARCO should then provide the highest representative concentration to be used in the analysis.

If non-ASARCO sources are included in the criteria pollutant modeling analysis, ASARCO should provide a source contribution analysis that separates the ASARCO contribution from the total contribution.

Due to the large number of modeling runs conducted, the applicant did not provide maps for each contaminant and averaging period. However, Bee-Line Software Short-term (BEEST) modeling input and output files were provided which facilitated plotting and obtaining the necessary tabular summaries. Tabularized summaries of the results were included in the report. The background concentration summary is provided in Section 5.0.

14.0 References

EPA, 1985 — *Guideline for Determination of Good Engineering Stack Height (Technical Support Document for the Stack Height Regulation) (Revised)*, EPA-450/4-80-023R, June 1985, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

EPA, 1990 — *New Source Review Workshop Manual Prevention of Significant Deterioration and Nonattainment Area Permitting (Draft)*, October 1990, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711

EPA, 2003 — *Guidelines on Air Quality Models (Revised).* Appendix W of 40 CFR Part 51, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711.

TCEQ, 1998 — "Screening Background Concentrations", TNRCC Memorandum from ADMT Leader Dom Ruggeri, September, 1998. Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

TCEQ, 1999 — *Air Quality Modeling Guidelines (Revised)*, RG-25. February 1999. Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

TCEQ, 2001 — *Modeling and Effects Review Applicability: How to Determine the Scope of Modeling and Effects Review for Air Permits*, RG-324. October 2001. Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.